

# Media Advertising and Ballot Initiatives: An Experimental Analysis

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## Introduction

In 2008, the citizens of California voted in favor of Proposition 2, which bans the use of cages for housing egg-laying chickens. Similar propositions in Arizona (Proposition 204 in November, 2006) and other states mandate stall-free and crate-free housing for sows and calves for veal, respectively. Media advertising is used heavily in state-level propositions because of the narrow focus of the issue, the geographic concentration of likely voters and the (typically) highly polarized nature of the campaigns. There is evident support for this issue among some consumers as cage-free eggs sell for a significant premium in retail stores (sometimes \$1.75 per dozen or more). What is less clear, however, is whether voting in initiatives similar to Proposition 2 is driven by advertising-inspired mass-support of the issue at hand, or whether it is highly motivated support by a small segment of the population that cannot be influenced by advertising. In this study, we examine the role of media advertising in the initiative process using an experimental analysis of ads used by both supporting and opposing sides for Proposition 2 in California in November 2008.

## Contribution

**(1)** Develop a new method of estimating the effect of marketing activities in voter behavior in public referenda. **(2)** The econometric model provides a way of separating the hype content of advertising from its informative content. In doing so, we also offer a new explanation for the observed asymmetric effects of positive and negative information on consumers' preferences. **(3)** Propose and apply a metric against which policies may be judged as being either for or against the public interest.

## Objectives

**(1)** Determine the willingness-to-pay for food products raised in a "humane" way, or one that is fundamentally different from current practice. **(2)** Determine the relative effect on WTP of media advertising presented either in support of an animal welfare initiative, or counter to it. **(3)** Determine whether media advertising shifts or rotates the demand curve, and the welfare implications of whether the dominant effect is a shift or a rotation.

## Experimental Design

To determine the willingness-to-pay for cage-free eggs, we use a Becker-deGroot-Marschak (1964, BDM) auction mechanism in which we offer subjects the opportunity to purchase eggs that are clearly labeled as cage-free.

### Experiment Procedure:

- We informed each participant that their information would be kept strictly confidential and their participation in the experiment was completely voluntary.
- Described the animal welfare issue and how it relates to the way in which eggs are produced on farms.
- Participants were then asked not to communicate with one another.
- Participants were introduced to the auction. The mechanics of the BDM procedure were carefully explained to the subjects, including the fact that it is incentive compatible.
- Subjects were provided an initial endowment of \$45.00, a regular-size chocolate bar and a dozen regular (non-cage-free) eggs.
- Did a simple example auction involving candy bars that demonstrated how the BDM mechanism works.
- The sample was divided into ten groups of fifteen participants each:
  - 2 groups bid on cage-free eggs with only prior information regarding the existence of Proposition 2 (the control group);
  - 3 groups bid after being shown a short media clip from a popular television show in which we had embedded ads developed in support of Proposition 2 (pro-cage-free legislation),
  - 3 groups bid after being shown ads against Proposition 2 (anti-cage-free legislation) and
  - 2 groups bid after being shown both sets of ads.
- Demographic questions were filled out.

- We test for shift or rotation effects of media advertising using an empirical model that captures the theoretical effects of advertising described by Johnson and Myatt (2006).
- Advertising operates on the dispersion of consumer valuations for the product.
  - If advertising provides "real information," then consumers who value the product relatively highly before the advertisement will like it even more after the ad, and those who value it less highly will like it even less.
- Dispersion of valuations widens and demand rotates clockwise.

- The analogy to political ads is straightforward: Polarizing issues that tend to have both *passionate supporters and equally passionate detractors* are "*highly differentiated products*," while more mundane issues that are not likely to inspire as much controversy are more akin to "homogeneous products."
- The marginal voter in a polarizing campaign is likely to have a valuation greater than the mean, so ads that provide real information are likely to increase the dispersion of demand, rotate the demand curve clockwise, increase the valuation of the marginal voter, and raise the "total take" on voting day.
- On the other hand, real information in a run-of-the-mill campaign is expected to reduce the dispersion of demand, essentially moving voters to the center of the issue, rotating the demand curve counter-clockwise, and increasing the willingness-to-pay of the marginal voter who began with a valuation that is below the mean.

Formally, we have:

$$\ln\left(\frac{\Pr(j=1)}{1-\Pr(j=1)}\right)=WTP_{il}=\frac{V_{il}}{\mu},$$

where,

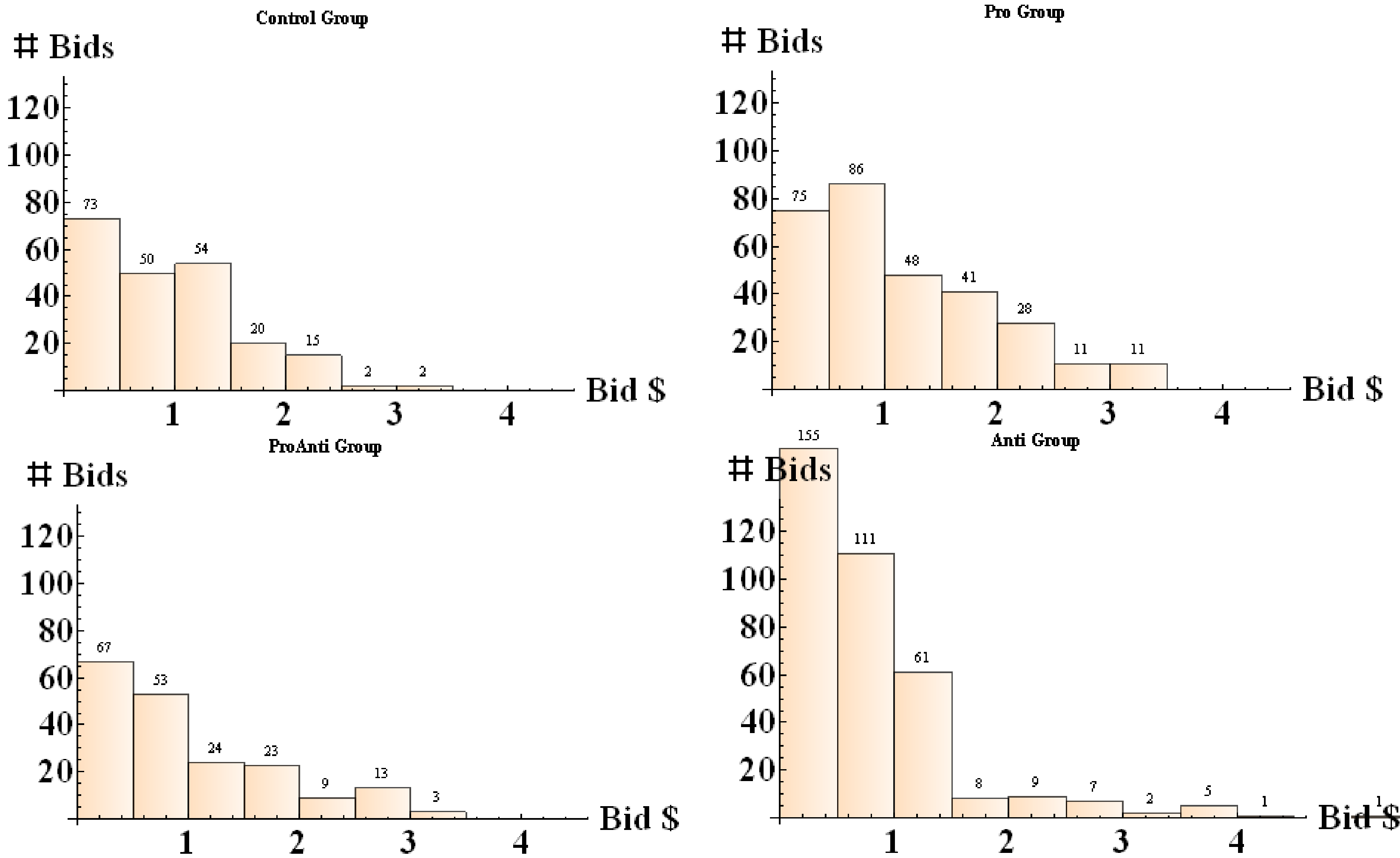
$$V_{ij}=\alpha_j+\sum_{k=1}^K\beta_kz_{jk}+\sum_{l=1}^L\gamma_lx_{il}+\sum_{m=1}^M\delta_ma_{mj}+\xi_j,$$

and,

$$\delta_m=\delta_{m0}+\delta_{m1}\sigma_m+v_m,$$

$$v_m\sim N[0,1]$$

## Data Summary



## Demand Estimation Results

	Mean of Rand. Param.		Std. Dev. of Rand. Param.	
	Estimate	t-ratio	Estimate	t-ratio
Constant	0.341*	3.086	0.533*	48.638
Pro	0.253*	7.525	0.352*	16.805
Anti	-0.070*	-2.158	0.132*	7.901
Pro / Anti	0.211*	5.626	0.416*	15.763

Note: A single asterisk indicates significance at a 5% level. Tests of spatial lag parameter determine preference for or aversion to differentiation.

- Relative to control, the "Pro" parameter implies a WTP increase of about \$0.25 / dozen.
- The "Anti" parameter indicates that ads in favor of the status quo, led participants to bid \$0.07 / dozen less than control.
- Combining both types of information, however, we find that participants are willing to pay nearly as much as if they only saw the "Pro" ads -- \$0.21 / dozen more than control.

- The "Pro" ads contain nearly three times the real information as "Anti" ads .
- "Pro" ads cause the willingness to pay to rise significantly.
- The "Anti" ads cause the willingness to pay to fall only marginally.
- Real information in this case is apparently worth only \$5.67 on an annualized basis, while the hype value of advertising is worth some 93.7% of the total, or \$83.82 per household per year.

## Conclusions

- The "hype" or shift effect dominates the rotation effect for each type of ad.
  - The ability of the ads supporting Proposition 2 were sufficiently effective in changing preferences to outweigh the negative effects associated with the opposing ads.
- The real information content of the ads was not inconsequential.
  - Over 6% of the change in consumer welfare associated with the ads came from the real information effect as opposed to the hype effect.

Therefore, the ads both changed preferences and managed to harden some voters' opinions on either side.

## Welfare Effects of Cage-Free Egg Advertising

	Mean	Std. Dev.
Base Utility	0.799	0.659
Shift Effect	0.885	0.679
Rotation Effect	0.905	0.862

Shift Effect per Dozen (cents)	27.781	46.464
Rotation Effect per Dozen (cents)	1.881	87.240
Total Effect per Dozen (cents)	29.663	99.616

Annual Shift Effect (\$)	83.822	14.019
Annual Rotation Effect (\$)	5.677	26.321
Annual Total Effect (\$)	89.498	30.056

- The ads in general reduce consumer welfare because the mass of consumers lower their WTP as a result of the ads.